

7A, and view the reproduced image with its viewing point "dv" coincided with the image shooting distance "df" of the parallax image data string D3, which, however, is not practical.

5 Therefore, the holographic stereogram producing device 10, when executing the image processing of the parallax image data string D3 by means of the image processing computer 16 in the image data processing unit 11, causes its viewing point conversion processing of the  
10 parallax image data string D3 to be carried out such that the reproduced image 60 may be constantly positioned in proximity to the hologram surface 51a of the holographic stereogram 51, and to generate a hologram image data D4, namely, an element hologram image data D5. Using the  
15 object light L2 undergone an image modulation by an element hologram image displayed on the transmission type liquid crystal display 29 based on the element hologram image data D5 subjected to the above-mentioned viewing point conversion processing and in combination with the  
20 reference light L3, the holographic stereogram producing device 10 exposes and records its holographic stereogram image on the hologram recording medium 4.

According to this viewing point conversion processing, in the holographic stereogram 51, as shown in  
25 FIG. 7B, its viewing point distance dv and the image shooting distance df of the parallax image data string D3 approximately coincide with each other, thereby enabling for the reproduced image 60 to be constantly positioned in the vicinity of the hologram surface 51a. Therefore,  
30 as shown in FIG. 7B, a clear and bright reproduced image 60 free from spatial distortion and blurring can be

reproduced in the holographic stereogram 51  
advantageously without requiring for the observer to view  
with his/her eyes in contact with the hologram surface  
51a.

5       The principle of the viewing point conversion  
processing of the invention for reconstructing the  
element hologram image data D5 will be described with  
reference to FIGS. 8 and 9, in which the element hologram  
image data string D5 comprising element hologram images  
10 d2 (d21, ----, d2n) of "n" pieces (sheets) is  
reconstructed from the parallax image data string D3  
comprising element parallax images d1 (d11, ---, d1m) of  
"m" pieces (sheets), which were captured by the re-  
centering method described above.

15       The holographic stereogram producing device 10,  
which is provided with the image processing computer 16  
as described above, displays element hologram images d2  
based on the hologram image data D4 processed with the  
viewing point conversion processing, that is, the element  
20 hologram image data D5, sequentially on the transmission  
type liquid crystal display 29 for exposure and recording  
on the hologram recording medium 4.

With reference to FIG. 8, suppose that an element  
hologram image EH is exposed and recorded at its  
25 respective exposure point ep (ep1, ---, epn) on the  
hologram surface 51a of the holographic stereogram 51  
which has a length "le" in the parallax direction, at  
this time a positional relationship between the element  
hologram image d2 of the element hologram image data D5  
30 and the element parallax image d1 of the parallax image  
data string D3 is defined as shown in FIG. 8. By the way,

in this drawing, the horizontal direction is defined as the parallax direction. At each exposure point  $ep$ , an element hologram image  $d2$  is exposed and recorded from the viewing point  $dv$  at an exposure angle  $\theta_e$ . To  
 5 simplify the explanation, only three points  $ep1$ ,  $ep2$  and  $epn$  are shown among the exposure points  $ep1$ , ---,  $epn$ . Needless to mention, the number of exposure points  $ep$  may vary depending on the lateral length  $le$  of the holographic stereogram 51 and a specified resolution of  
 10 rendering in the holographic stereogram image, however, it is assumed, for example, that an equidistance pitch of 0.2 mm, and  $n=500$ .

A pitch  $\Delta le$  of each exposure point  $ep$  is equal to a pitch of the element hologram image  $d2$ , and has the  
 15 following relationship (equation 1) relative to the lateral length  $le$  of the holographic stereogram 51.

$$le = n \times \Delta le \text{ ----- (1)}$$

20 Further, in the same drawing, " $lc$ " denotes a shooting width of the parallax image data string  $D3$  comprising the element parallax images  $d1$  of " $m$ " pieces (sheets), " $dv$ " denotes the viewing distance, and " $df$ " denotes the image capture distance of the parallax image  
 25 data string  $D3$ . By the way, the pitch  $\Delta le$  of each exposure point  $ep$  and the image capture width  $\Delta lc$  of the element parallax image  $d1$  are not always equal, however, the parallax distance  $dv$  and the image shooting distance  $df$  are set equal to each other. At each exposure point  
 30  $ep$  on the holographic stereogram 51, each of the element hologram images  $d2$  sequentially displayed on the